

**REMARKS**

**Foreign Priority**

Applicant thanks the Examiner for acknowledging the claim to foreign priority under 35 U.S.C. § 119(a)-(d), and also that the certified copy of the priority document has been received.

**Information Disclosure Statement:**

Applicant thanks the Examiner for initialing and returning the form PTO-1449 filed on April 2, 2004 thus indicating that the references listed thereon have been considered.

**Drawings:**

Application also thanks the Examiner for indicating that the drawings filed on April 2, 2004 have been accepted.

**Claim Rejections:**

Claims 11-18 are all of the claims pending in the present application, and currently all of the claims stand rejected.

***35 U.S.C. § 112, 1<sup>st</sup> Paragraph Rejection - Claims 11-18:***

Claims 11-18 are rejected under 35 U.S.C. § 112, 1<sup>st</sup> paragraph, as failing to comply with the enablement requirement. In view of the following discussion, Applicant respectfully traverses the above rejection.

First, the Examiner has rejected the claims indicating that the expressions “MIN<sub>i,j</sub>” and MIN<sub>i</sub>” (found in claims 11, 12, and 17) are not specifically pointed out or defined in the specification of the application. The Examiner further alleges that this expression is intended to mean “f<sub>min(i,j)</sub>”. Applicant respectfully disagrees.

In rejecting the claims, the Examiner explained that the expression " $f_{\min}(i,j)$ " has a minimum numerical value where  $f_{\min}$  is taken from the set of all of the expressions  $f$  where  $i$  and  $j$  vary independently as allowed. Thus, it appears that the Examiner does not recognize the nomenclature used in the expression " $\text{MIN}_{i,j}$ " and believes this to be unconventional.

However, Applicant respectfully disagrees with the Examiner, and submits that the nomenclature used in the claims is known, such that the as skilled artisan would know how to make and use the claimed invention.

First, Applicant submits that there is a difference between the expressions used in the claims and that identified by the Examiner (i.e.  $f_{\min}(i,j)$ ). To aid in demonstrating the distinction, Applicant directs the Examiner to the website:

<http://www.mathworks.com/access/helpdesk/help/techdoc/ref/min.html>

(Additionally, a courtesy print out is attached hereto for the Examiner's reference.)

Because of the recognized distinctions between the expression used in the claim, and the expression identified by the Examiner, Applicant submits that the expression used in the claims is accurate.

Moreover, Applicant submits that as the nomenclature used in the claims would be recognized by a skilled artisan such that they would be able to make and use the claimed invention. Accordingly, Applicant hereby requests the Examiner reconsider and withdraw the above 35 U.S.C. § 112, 1<sup>st</sup> paragraph rejection of the claimed invention.

*“PUMP MODULATOR”:*

Second, the Examiner has also indicated that the present application simply shows the “pump modulator” as a “black box,” and fails to sufficiently describe the internal workings of the pump modulator to allow a skilled artisan to make and use the invention.

In making this rejection, it appears that the Examiner feels that a normal, commonly known, pump modulator would be unable to perform or function as the modulator in the claimed invention without some modification, which would not be known or understood in the art.

Applicant respectfully submits that the Examiner’s comments and understanding are incorrect. Specifically, the present invention is not directed to, nor does it require, a novel or little known pump modulator internal structure. Instead, the present invention describes a novel way and methodology to employ a pump modulator.

Stated differently, Applicant submits that the present invention can be used with known pump modulators (structurally), and that the only changes that would need to be made would be to the operating functionality, which is well within the capabilities of a skilled artisan. As an example, Applicant references U.S. Patent No. 6,611,368 to Grant et al. which discloses a Raman pump that can be adapted to use any electronic function.

Thus, Applicant submits that a skilled artisan is capable of making and using the claimed invention. Accordingly, Applicant hereby requests the Examiner reconsider and withdraw the above 35 U.S.C. § 112, 1<sup>st</sup> paragraph rejection.

***35 U.S.C. § 102(e) Rejection - Claims 11-18:***

Claims 11-18 are rejected under 35 U.S.C. §102(e) as being anticipated by Grant et al. (U.S. Patent No. 6,611,368). In view of the following discussion, Applicant respectfully traverses the above rejection.

As an initial matter, Applicant notes that on page 6 of the Office Action, the Examiner has indicated that all of the claim limitations which the Examiner *italicized* have been ignored. Specifically, the Examiner has argued that this claim language is an “intended use” and merely functional, and thus will not be considered to give any patentable weight to the claims.

Applicant disagrees with the Examiner’s characterization of these limitations and submits that it is improper for the Examiner to ignore these claim language.

For example, the claims of present application set forth a “multiplexing controlling means”. In the claims, the “multiplexing controlling means” time-division multiplexes the plurality of optical Raman pump signals, as claimed using the expression  $f_c = \text{MIN}_{ij}$ .

Because this limitation is a “multiplexing controlling means”, this limitation can be characterized as a “means + function” limitation under 35 U.S.C. § 112, 6<sup>th</sup> para. Because of this, Applicant submits that it is acceptable to define the “multiplexing controlling means” in terms of the function that is performed.

Thus, although Applicant agrees that the limitation starting with “characterized in that the time-division multiplexing frequency ...” is “functional” in nature, Applicant submits that under the provisions of 35 U.S.C. § 112, 6<sup>th</sup> para., this is acceptable and should be considered by the

Examiner as a positive limitation of the claim. To ensure that this aspect of the invention is clear, Applicant has amended the claims, as shown in the previous section.

Because the language of the claims, previously ignored by the Examiner, should be considered, and because Grant fails to disclose each and every aspect of the claimed invention, Applicant hereby requests the Examiner reconsider and withdraw the above rejection of the claims.

Additionally, Applicant notes that systems similar to that disclosed in Grant is discussed in the present application. In Grant, and similar systems, the shift of the modulation frequency is only a few MHz. One of the main problems associated with systems such as these, is the presence of Rayleigh noise, which is higher with a modulated pump. This problem is not solved by the Grant system.

However, the present invention sufficiently addresses the above problem by finding the frequencies where the noise effect is reduced by parallel increase of gain. There is no disclosure or teaching in Grant of minimizing the corner frequency of the pump to signal modulation transfer function. Therefore, Grant fails to disclosure, teach or suggest the claimed invention.

In view of the foregoing, Applicant submits that Grant fails to disclose each and every feature of the claimed invention. Therefore, Applicant submits that Grant fails to anticipate the claimed invention, as required under 35 U.S.C. § 102(e). Accordingly, Applicant hereby requests the Examiner reconsider and withdraw the above 35 U.S.C. § 102(e) rejection of the above claims.

AMENDMENT UNDER 37 C.F.R. §1.111  
Application Number: 10/815,845

Our Ref: Q80562  
Art Unit: 3663

**Conclusion:**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

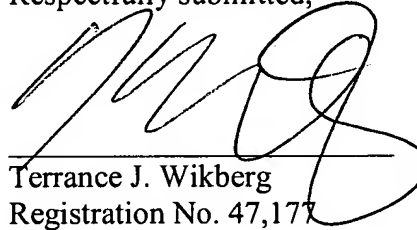
SUGHRUE MION, PLLC  
Telephone: (202) 293-7060  
Facsimile: (202) 293-7860

WASHINGTON OFFICE

**23373**

CUSTOMER NUMBER

Respectfully submitted,



Terrance J. Wikberg  
Registration No. 47,177

Date: December 15, 2005

## MATLAB Function Reference



# min

Minimum elements of an array

## Syntax

```
C = min(A)
C = min(A,B)
C = min(A,[],dim)
[C,I] = min(...)
```

## Description

`C = min(A)` returns the smallest elements along different dimensions of an array.

If `A` is a vector, `min(A)` returns the smallest element in `A`.

If `A` is a matrix, `min(A)` treats the columns of `A` as vectors, returning a row vector containing the minimum element from each column.

If `A` is a multidimensional array, `min` operates along the first nonsingleton dimension.

`C = min(A,B)` returns an array the same size as `A` and `B` with the smallest elements taken from `A` or `B`. The dimensions of `A` and `B` must match, or they may be scalar.

`C = min(A,[],dim)` returns the smallest elements along the dimension of `A` specified by scalar `dim`. For example, `min(A,[],1)` produces the minimum values along the first dimension (the rows) of `A`.

`[C,I] = min(...)` finds the indices of the minimum values of `A`, and returns them in output vector `I`. If there are several identical minimum values, the index of the first one found is returned.

## Remarks

For complex input `A`, `min` returns the complex number with the largest complex modulus (magnitude), computed with `min(abs(A))`, and ignores the phase angle, `angle(A)`. The `min` function ignores NaNs.

## See Also

[max](#), [mean](#), [median](#), [sort](#)



MinimizeCommandWindow